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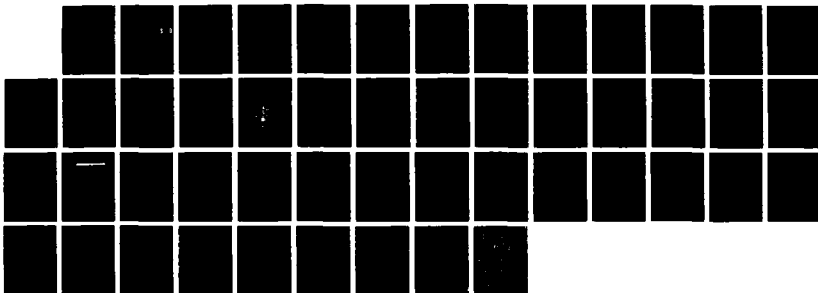
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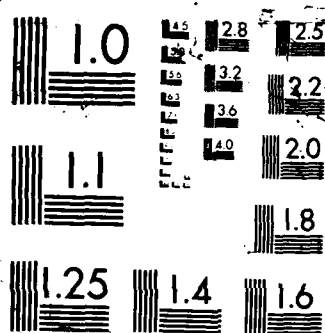
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Outmoded Concept?

by
Major Henry S. Scharpenberg
Armor

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School of Advanced Military Studies
U.S. Army Command and General Staff College
Fort Leavenworth, Kansas

4 December 1987

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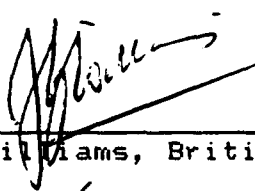
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School of Advanced Military Studies
Monograph Approval

Name of Student: Major Henry S. Scharpenberg
Title of Monograph: Direct Support Artillery for the Defensive
Battle: Is It an Outmoded Concept?

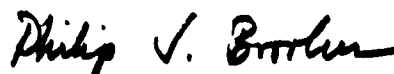
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Accepted this 28th day of December 1987.

ABSTRACT

Direct Support Artillery for the Defensive Battle: Is It an Outmoded Concept? by MAJ Henry S. Scharpenberg, USA, 42 pages.

Doctrinally, artillery in the defense is allocated to maneuver units to lend the weight of its fires to the direct fire battle. In the direct support mission, its ability to mass fires is limited by habitual associations that allocate at least one artillery battalion to each committed maneuver brigade. The range of its effectiveness is constrained to the ability of the brigade to acquire and develop targets, normally 3-5 kilometers. A better solution might be upgrade battalion mortar platoons with weapons capable of firing armor-defeating improved conventional munitions and assign them the mission of providing suppressive fires for the brigade; thereby making available the traditionally direct support battalions to fire under division control. This would capitalize upon the superior targeting and intelligence capabilities at division to defeat an enemy who echelons his forces in order to destroy a defender with mass and momentum at a time and place of the attacker's choosing. This monograph will examine the feasibility of such a proposal.

An examination of Soviet doctrine and vulnerabilities concludes specific opportunities for disruption of offensive momentum and destruction of attacking forces are presented. U.S. intelligence acquisition and target development capabilities at division level, however, greatly exceed those available to the maneuver brigade commanders. Doctrine allocates the majority of divisional indirect fire assets to the brigade close-in battle. The result is that the level of command in the division with the greatest allocation of indirect fire assets is not able to locate and engage targets early enough to prevent their mass and momentum from being felt at the FLOT. Ballistic characteristics of indirect fire systems, moreover, limit their ability to provide a target effect greater than suppression once the target becomes dispersed.

The study concludes that upgrading heavy mortar platoons organic to maneuver battalions will collectively provide the brigade commander with the indirect fire suppression capability essential for the success of the close-in battle. Previously committed direct support artillery battalions will then be available to engage attacking enemy formations during their most critical and vulnerable times. The increased level of destruction inflicted upon the enemy before he reaches friendly positions should compensate for the brigade's loss of its direct support battalion, and provide the division commander with a cost effective, responsive, and extremely potent deep battle capability.

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I. INTRODUCTION

If the U. S. Army is ever called upon to defend against an attack by the Warsaw Pact or Soviet-trained surrogate forces, the fires provided by field artillery systems will constitute a major portion of the combat power available to U. S. heavy divisions. The employment of that artillery, and the selection of targets against which its fires are massed, have been the focus of considerable debate since the advent of the 1982 operations manual, FM 100-5. In this capstone document, the division commander is charged with fighting a unified defensive battle consisting of close, deep, and rear operations. The importance of the deep battle is viewed to be as critical to overall success of the mission as the close-in battle. Combat leaders will be required to allocate scarce resources to fight both the close-in and deep battle in an environment where friendly forces will be considerably outnumbered. Division commanders will be faced with the dilemma of allocating enough fire support assets to committed brigades in order to fight the close-in battle while simultaneously retaining adequate assets at division level to wage the deep battle and prevent the enemy's mass and momentum from overwhelming defending forces.

Doctrinally, artillery has been allocated to maneuver units to lend the weight of its fires to the direct fire, or close-in battle. In this role, its ability to influence the outcome with massed indirect fires has been limited in defensive operations by habitual associations that allocate at least one artillery battalion to each committed maneuver brigade. The employment of that battalion has been predicated upon the maneuver commander's concept of the operation and his ability to identify enemy targets

in a time sensitive manner for the artillery to engage. This ability is limited to the acquisition range of the intelligence systems available to the brigade and the reporting and information analysis systems supporting the brigade. These constraints translate to a target acquisition and analysis system that can only identify targets appearing between one to five kilometers from the Front Line of Troops (FLOT). The artillery remaining under division control, usually a battery of nine Multiple Launch Rocket System (MLRS) launchers, plus whatever augmentation is provided by Corps artillery assets, may be insufficient to deal with the mass of enemy forces expected.

Augmenting the indirect fires available at maneuver brigade level are the heavy mortar platoons organic to armor and mechanized infantry battalions, and armored cavalry squadrons. Heavy mortars in the U.S. Army, however, have been historically neglected and the limited range and lack of anti-tank improved conventional munitions (DPICM or equivalent) limits their usefulness as currently employed.

An alternate solution to the employment of direct support artillery is to centralize its use under division control where it can capitalize upon the organic intelligence and targeting capabilities available to the division commander. The advantage to this proposal is that it provides the division commander with the fire support means to disrupt an enemy who achieves mass and momentum by echeloning his forces at a time and place not of the defender's choosing. Defending brigades are then presented with an enemy force whose attacking momentum has been slowed to the degree where the ratio of forces in contact favors the defender and the enemy force is literally defeated in detail. The

disadvantage is that it removes a source of responsive indirect fire from the control of the brigade commander who must fight the close-in battle. As a replacement for the direct support artillery previously available to the brigade, organic heavy mortar platoons in maneuver battalions could be upgraded to battery status by replacing the current M30 series 107mm mortar with a longer ranging, DPICM capable mortar and increasing the number of systems available.

This paper will examine the viability of such a proposal by examining Soviet offensive doctrine to determine what critical opportunities, if any, exist for artillery interdiction. U.S. intelligence gathering capabilities will be examined to ascertain whether the key opportunities presented by the Soviets can be determined and located with the necessary accuracy to permit destruction or disruption by indirect fires. A comparison will be made between the tactical advantage provided by artillery firing in its normal direct support role and that provided by artillery firing under division control. Using this comparison, an assessment will be made as to what advantage early destruction of enemy forces by division controlled artillery provides to the defender over enemy forces engaged by traditional direct support artillery. The feasibility of upgrading current mortar capability with systems available worldwide as well as the ability of upgraded mortars to compensate for the loss of direct support artillery will be examined.

II. SOVIET OFFENSIVE DOCTRINE AND VULNERABILITIES

Fundamental to Soviet offensive doctrine are the principles of mass, momentum, and continuous combat action. Enemy momentum in the attack is sustained by the echelonment of forces in depth

so that follow-on echelons can pass through or around the committed leading echelons to pile on a defending enemy with fresh forces and thereby sustain continuous offensive action. The Soviets emphasize swift and efficient movement of combat power from one point on the battlefield to another. This is achieved by rapid column movement in march formation to successive deployments into prebattle and then attack formation. Units rehearse the march, and the execution of the march is strictly controlled. Standard battle drills are practiced to transition from march formation to prebattle or attack formation. The column formation, established before the unit begins its march, is designed to minimize or preclude any reorganizations of combat assets before commitment to battle. The nature and formation of the march column is the first vulnerability of Soviet doctrine to be examined, as its interdiction prior to the point and time of commitment will disrupt the tempo of the offensive, and preclude any re-task organization prior to battle.

Within Soviet command and control, the next higher commander specifies routes, start lines, lines of deployment, and the direction and time of attack. The lengths of routes and the distances to be traveled are broken down into five kilometer segments. Probable speeds based upon the factors of METT-T are calculated, and troop movement schedules are prepared. A typical Motorized Rifle Regiment (MRR) march formation would consist of reconnaissance assets followed by the advance guard, flank security elements, the main body, and rear security elements. Reconnaissance assets would be provided by the Regimental Reconnaissance Company. Following these early warning assets are the four maneuver battalions of the regiment with combat support

and combat service support assets echeloned in column formation so as to provide sequential commitment of combat forces and maximum security during movement. Figure 1-1 shows a reinforced tank battalion action as the advance guard of a regimental sized formation and provides a good illustration of the echelonment previously discussed.

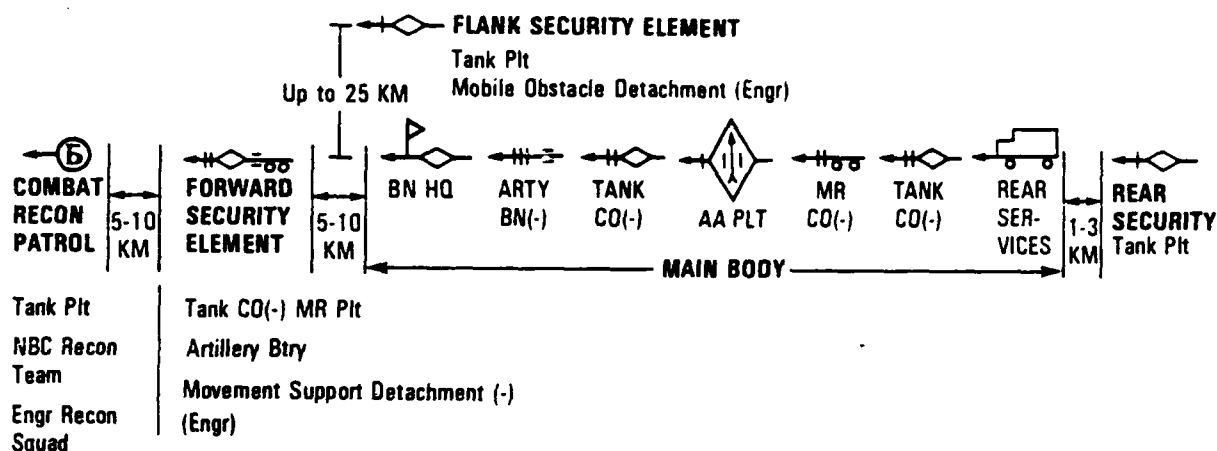


FIG. 1-1 ECHELONMENT OF FORCES AT BATTALION LEVEL¹

While providing a perceived degree of flexibility to the Soviet commander, the echelonment of forces in march formations also presents opportunities for interdiction. Units separated by only 3 to 5 kilometers will have insufficient time to react to enemy action given a rate of march of 20-30 kilometers per hour during the day and 15-20 kilometers per hour at night. This translates to 5-10 minutes of reaction time during daylight and 12-15 minutes at night if the preceding element in the march column is attacked by artillery or aviation. This reaction time will further be reduced if the unit is traveling under radio

listening silence, as the Soviets intend to do.

Each motorized rifle or tank regiment employs a traffic control platoon to facilitate movement. These elements are placed at critical points along the route of march such as turns, intersections, and choke points. Their use permits less reliance on maps and radio communications. Traffic control personnel, coupled with a reliance upon hand and arm signals, flags, and light signaling devices, minimize the need for radio communications. Their employment, however, also constitutes a vulnerability as their destruction would seriously disrupt the smooth forward movement of the regimental march column. Traffic control units assist battalion formations who will normally march on one route, regiments on one or two routes, and divisions on up to four routes.

Assisting movement along designated routes are Movement Support Detachments (MSD) which are engineers whose missions are to remove obstacles, perform limited road repair, provide route reconnaissance, and organize bypasses. Destruction of these MSDs by timely and accurate artillery fires will provide severe problems for the Soviet commander attempting to commit his forces in accordance with a strict timetable formulated at higher headquarters.

A Soviet regiment expecting a meeting engagement or a hastily prepared defense will advance from assembly areas approximately 20 kilometers from the line of contact. Table 1-2 depicts how far from the Front Line of Enemy Troops (FLET) Soviet formations will deploy.

<u>Type Formation</u>	<u>Distance from FLET</u>
Battalion Column	8-12 km
Company Column	4-6 km
Platoon Column	1.5-4 km
Assault	.5-1.5 km

TABLE 1-2 SOVIET DEPLOYMENT DISTANCES²

Note: Of importance to the U.S. commander is what assets are in place to observe and attack these changes of formation at the doctrinal distances from the Front Line of Troops (FLOT). This point will be discussed in Section III.

Once the regiment has transitioned into assault formation, it will attempt to maintain an attack speed of 12 km/hr. For the U.S. observer trying to adjust artillery fire on an enemy approaching his position, this equates to 200 meters of distance traversed by the attacker every minute. The motorized rifle or tank company in attack formation will present a frontage of 500-800 meters which exceeds the standard width of 400 meters for an eight gun 155mm howitzer battery final protective fire. Following the lead tanks at a distance of 100-400 meters will be the dismounted infantry who will present a perfect target for artillery or mortar fire. If this type of attack is not successful, or if the advance guard of the regiment cannot penetrate the flanks and rear of the defender, a deliberate attack against a prepared defense will be conducted.

Soviet doctrine requires a 3-5:1 ratio in tanks, a 4-5:1 ratio in infantry, and a 6-8:1 ratio in artillery for a successful attack against a prepared defense. Suppression of a prepared defense will require 60-80 tubes of artillery per km of front.³

If a deliberate attack is required by the tactical situation, Soviet doctrine will present additional vulnerabilities for exploitation.

Depending on the tactical situation and its mission, a regiment conducting in a deliberate attack will occupy a front of 3-8 km. While the maneuver units are transitioning into attack formation, the artillery is responsible for providing preparatory fires to suppress known and likely enemy locations. Emphasis is placed upon neutralization of Anti-Tank Guided Missile (ATGM) positions. During this artillery preparation for a deliberate attack which may last 40-50 minutes, maneuver units must proceed from their assembly areas and transition through the series of formations which have been described previously. This transition is dependent upon supporting artillery preventing enemy interference with the sequential deployment into attack formation through the use of indirect or direct fire assets. Whether Soviet artillery units can fire continuously for extended periods of time in an active counterbattery environment is highly questionable. One documented Soviet training exercise required the supporting artillery units to fire a 50 minute preparation in which each artillery tube expended 130 rounds without displacing.⁴

Logistically sustaining artillery preparations for deliberate attacks provides an additional vulnerability. Soviet artillery norms would require 30,000-40,000 rounds to be fired against a two battalion prepared defense which would present 60-70 targets. The ammunition requirement for the artillery preparation alone would be 2,500-3,000 tons.⁵ Although sufficient ammunition vehicles exist in the Soviet or Warsaw Pact (hereafter referred to as THREAT) force structure to supply that required amount, the

movement and stockpiling of the ammunition would provide a lucrative target. Logistical problems, however, will not be solely confined to the artillery preparation. In offensive operations, regimental POL and ammunition supply points are located 10-15 km from the FLET. They contain the majority of expected ammunition requirements, known as "units of fire", available to the regiment. For artillery units, the regimental stockpile equates to 55% of available ammunition within the division, and 50% for tank, motor rifle, and ATGM units. The Soviets calculate their artillery units need three units of fire against a prepared defense and two units against a hasty defense. Tank units will require 1.5 units of fire per day.⁶ If the regimental ammunition point is destroyed by friendly interdiction, maneuver and artillery units will not have the minimum ammunition available they believe necessary for successful prosecution of the deliberate attack.

Command and control below division level is subject to disruption by indirect fires. Regimental and battalion staffs are small, and they are overburdened by requirements from higher headquarters which causes their own schemes of maneuver to be inadequately prepared due to shortage of planning time. When a THREAT battalion is called upon to operate in a semi-autonomous role such as forward detachment, flank guard, or advanced guard, the lack of planning time can have serious repercussions if friendly interdiction stymies the original scheme of maneuver.

Doctrinal placement of assets in the attack will also present opportunities for interdiction because of their proximity to the FLOT. Table 1-3 depicts the deployment of division elements in the attack.

<u>Element</u>	<u>Deployment</u>
Regimental Artillery Group	1-4 km from the forward edge of battle area (FEBA)
Divisional Artillery Group	3-6 km from FEBA
Multiple Rocket Launcher Battalion	3-6 km from FEBA
Division Main Command Post	Up to 15 km from FEBA
Division Forward CP	Up to 5 km from FEBA
Regimental Main CP	Up to 5 km from FEBA

TABLE 1-3 DIVISIONAL ECHELONMENT OF FORCES⁷

Of particular interest is the placement of the artillery assets. The massive number of artillery tubes required to ensure success of the deliberate attack are well within range of all U.S. tube artillery systems whose doctrine and employment will be discussed in section IV.

III. U.S. INTELLIGENCE, TARGETING, AND DESTRUCTION CAPABILITIES

In order to capitalize on THREAT doctrinal vulnerabilities previously discussed, U. S. forces must be able to analyze the vast amounts of information obtained and distill it to the most critical items of intelligence, locate enemy targets with the necessary degree of accuracy , transmit key targeting data to fire support assets in a time sensitive manner, and quickly destroy the targets engaged. This section will examine U.S. capability to fulfill these requirements, and assess which level of command in the division is best capable of successful completion.

The ideal use of fire support assets is to employ them against an enemy force before he is able to close with defending forces and exact friendly losses, or more seriously, cause

catastrophic defeat. This is particularly critical against an enemy who sequentially employs his forces in order to achieve uninterrupted mass over time. U.S. Army doctrine has recognized the necessity of early destruction of enemy forces by incorporating deep battle as one of the five elements of the battlefield framework. The means available for deep battle, or deep attack, however, are limited in number and effect. Air delivered ordnance, indirect fire assets, army aviation, unconventional warfare forces, and when feasible, maneuver forces, are the principal weapons of deep battle. Effective employment of these weapons systems and forces is dependent upon careful intelligence preparation of the battlefield and responsive surveillance operations.

Proper employment of supporting artillery is contingent upon the ability to locate targets. Intelligence at division level is provided by fire support teams (FIST) and fire support elements (FSE) of maneuver units, regimental and divisional cavalry squadrons, tactical aerial reconnaissance (TAR), FA target acquisition (TA) assets, spot reports from assigned personnel and units, and corps and divisional military intelligence (MI) units. Figure 2-2 depicts the MI resources available to the division commander and their approximate effective range.

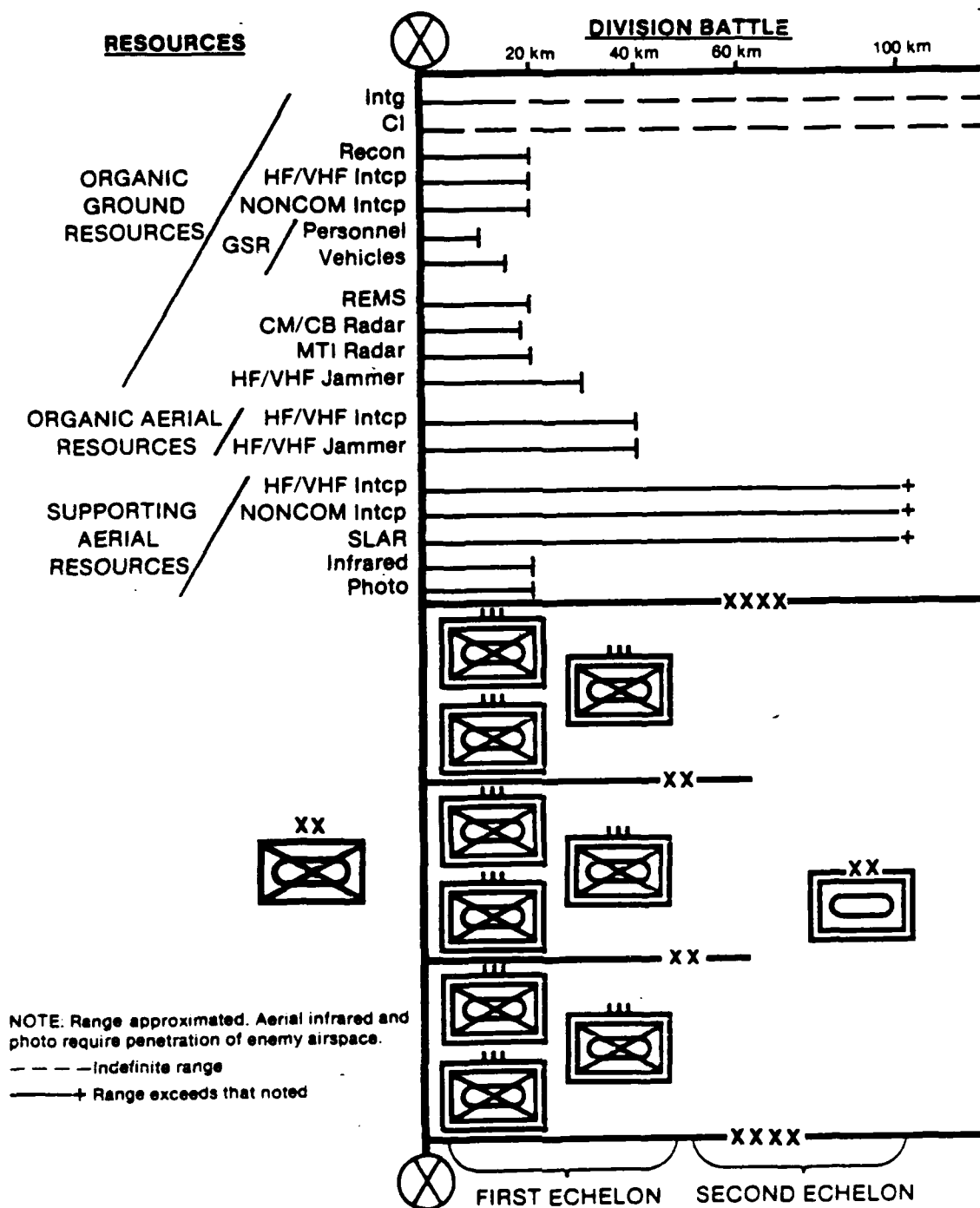


FIG. 2-2 U.S. DIVISIONAL MI RESOURCES

Several of the systems listed above bear further amplification. The AN/TPQ-36 Counter-Mortar (CM) Radar can locate counterfire targets within a 24 km range and interface digitally

with the TACFIRE artillery fire direction system. Its companion, the AN/TPQ-37 Counter-Battery (CB) Radar can locate enemy tube artillery and MRL systems out to a distance of 50 km. There are a total of five CM/CB systems organic to the division, and all are linked to TACFIRE.

The Long Range Surveillance Detachment (LRSD) performs ground reconnaissance for the division, and is organized with a detachment headquarters, two base stations, and six reconnaissance teams. All are equipped with High Frequency (HF) burst transmission radios and report directly to the Division Tactical Operations Center (DTOC) support element of the MI battalion. Additionally, once the Remotely Piloted Vehicle (RPV) is fielded by either the FA or MI communities, its pinpoint targeting and real-time intelligence gathering capabilities will be provided to the DTOC.

The Quickfix Platoon (organic to the General Support Aviation Company of the Combat Aviation Brigade and mounted in UH-60 helicopters) provides airborne communications intercept, Direction Finding (DF), and Electronic Counter-Measures (ECM) under the operational control of the MI battalion. The intelligence they provide is reported directly to the Technical Control and Analysis Element (TCAE) of the MI battalion for Signals Intelligence (SIGINT) analysis and dissemination within the division.

Guardrail, a system found at corps level, provides collection and emitter location information for THREAT communications systems. It intercepts and locates HF, Very High Frequency (VHF), and Ultra High Frequency (UHF) emitters, processes the information in near-real time, and reports over secure, direct communication links. Mounted in RU-21 and RC-12 aircraft, the system is

employed in pairs in the standoff role over friendly territory. Guardrail and any other MI augmentation from corps MI assets such as an Electronic Warfare (EW) Platoon (which has a multi-channel intercept section and reporting and analysis team) are not subordinated to a headquarters lower than the divisional MI battalion.*

The voluminous amount of information available to the division from all sources contrasts greatly with the relative paucity of intelligence at the disposal of the brigade commander. The primary sources of intelligence for the brigade commander are reports generated by units in contact and their supporting FIST and FSE personnel. These are limited by the physical positioning of personnel on the ground and are normally confined to observing THREAT activity within 1 to 5 km from the FLOT. Portions of the intelligence information available to the division are ultimately provided to the brigade once security classifications are considered and analysis has been completed. This results in the brigade commander being extremely well-informed about what is happening to his units at the moment, but not so well-versed as to what is going to happen in the immediate future. In real terms, he will probably see the attacking enemy regiment deploy from company columns into platoon columns or assault formation. By this point, however, the enemy will present multiple aiming points for interdiction rather than one or two targets if the regiment could be acquired and attacked while it was still in march column.

Information gathered from intelligence sources available either at brigade or division level must be distilled and analyzed to produce a usable product upon which action may be based. The intelligence preparation of the battlefield assists that goal and

is the doctrinal approach for identifying key items of information required by commanders at all levels. This process includes information requirements such location, direction, and speed of enemy echelons and their subordinate units, the location of any reinforcing echelons, as well as the location of FA units, ADA units, and other high priority targets. For targeting purposes, specific locations of enemy command posts, fire direction control centers, radio and radar reconnaissance sites, and TA sites are required.

In order to monitor enemy intentions and the forward progress of his maneuver units, Named Areas of Interest (NAI) and Target Areas of Interest (TAI) are established. Named Areas of Interest are points or areas on the ground, along a particular avenue of approach, through which enemy activity is expected to occur. Target Areas of Interest are areas or points along a mobility corridor where successful interdiction will cause the enemy to abandon a particular course of action or force him to dedicate substantial engineer support in order to continue. These portray what the enemy will do, in what location, and with what forces. Available acquisition assets are focused through the use of NAIs. Of greater interest to the targeting process is the use of TAIs which focus targeting assets. The IPB process and the designation of NAI's and TAI's help distill the vast amounts of information provided by the resources previously discussed and provide a product to the commander that can be acted upon.

The DTOC support element from the divisional MI battalion is the producer of intelligence at division level. Incorporated in this element is the Collection Management and Dissemination (CM&D) section and the All Source Production Section (ASPS). The CM&D

performs collection management for the division. It takes the division commander's intelligence requirements and tasks them to MI battalion assets as collection missions. The CM&D also disseminates combat information and intelligence to all units within the division as well as higher and adjacent units.

The ASPS performs the division's IPB and brings together information from all sources to be analysed, processed, correlated, and integrated. It provides a finished intelligence product and precise targeting data for attack by indirect fires. National intelligence products and Sensitive Compartmented Information (SCI) from corps, when available, are provided to the ASPS.

Further refinement of targets is provided by the designation of High Value Targets (HVT) and High Payoff Targets (HPT). High Value Targets are those whose loss to the enemy can be expected to substantially degrade an important battlefield function. High Payoff Targets are those which if successfully attacked, will contribute substantially to the success of friendly plans.

The ASPS identifies HVTs using the IPB and target value analysis (to be discussed later) and, in coordination with the division FSE and G3, recommends HPTs for destruction to the commander. Through target development, the ASPS plays a key role in the targeting process.

The division FSE is a substantial element collocated with the DTDC and provides centralized targeting, coordination, and integration of fires delivered on surface targets by fire support means under the control of or in support of the division. In the heavy division, this element consists of twenty-six personnel with equipment, supervised by a lieutenant colonel, and capable of

sustained and continuous service.¹⁰

These procedures suggest there is a close working relationship between the intelligence and fire support staffs at division. The relationships between the G2, the Fire Support Coordinator (FSCCOORD), and their staffs are mutually supporting. The G2 provides timely intelligence to the FSE for targeting purposes and assists the FSE in determining the best means of target engagement. The FSE, in turn, provides targeting intelligence information to the G2 which has been collected from direct observation by FISTs, aerial artillery observers, and target acquisition systems.¹¹ This relationship is further cemented by the presence of a FA liaison officer within the ASPS.

The Field Artillery Intelligence Officer (FAIO) operates within the ASPS. He helps identify targets and requirements for target development, evaluates incoming reports to identify possible targeting data, and expedites the reporting of targets generated to the division FSE once they have been developed by the ASPS.

The other element at division level oriented on the targeting process not previously mentioned is the Division Artillery (DIVARTY) TOC. This staff section develops targets and conducts the planning, direction, control, and coordination of indirect fires from all FA units supporting the division. Located within the DIVARTY TOC is the target production section of the divisional Target Acquisition Battery (TAB). This section's ability to produce targets from information provided by TAB assets adds significantly to the target development at division.

The meager resources present at brigade level to analyze information and develop targets provide a stark contrast to the

tremendous capability available at division level. The FSE for a heavy brigade consists of one field-grade officer (O-4), one fire support sergeant (E-7), and two soldiers. Their duties include: preparing and executing the brigade's fire support plan, preparing nuclear and chemical fire support plans, informing higher and lower FSEs of the brigade's situation, exchanging battlefield information with the brigade, and operating and displacing the FSE portion of the brigade TOC. It is highly questionable whether four men can perform all of the listed duties on a continual basis, and develop targets rapidly enough for their supporting artillery to engage.

The MI element available to the brigade is equally spartan. A two man cell called the Intelligence and Electronic Warfare Support Element (IEWSE) is positioned with the brigade TOC and provides the primary liaison with MI assets. Entering the MI battalion operations net and the collection and jamming tasking/reporting net, the IEWSE provides information collected by the MI battalion directly to the brigade S-2. It should be noted that the information available to the IEWSE is only a small portion of that which is available to the division. Any analysis and target development that occurs at the brigade must be performed by the two man IEWSE, the small FSE, and the brigade S-2 section of eight personnel, concurrently with their other duties.

Assuming the necessary trained personnel are present and the required information about the THREAT has been obtained, the next step in target development is the process of target value analysis (TVA) which links the effects of attacking a target directly to the function that target provides for the THREAT. TVA analyzes THREAT doctrine, tactics, equipment, organization, and expected

behavior and provides a systematic approach to determine which targets out of the total THREAT array should be attacked for the maximum tactical benefit. The target value analysis process is contained within the TACFIRE data base and assists the process of fire planning at division.¹²

Once targets have been identified and priorities established, three guidelines for desired target effect are matched against targets engaged. Enemy forces or facilities engaged by FA means will either be suppressed, neutralized, or destroyed. Suppression limits the ability of enemy personnel in the target area and its effects last only as long as the indirect fires are continued. Suppression would be the target effect desired against likely, suspect, or inaccurately located enemy positions.

Neutralization of a target generally inflicts a minimum of 10% casualties and renders it temporarily ineffective. A unit that has been neutralized will become effective again once its casualties are replaced and its equipment repaired.

Neutralization is the desired effect when targets can be located by accurate map inspection, indirect fire adjustment, or TA assets. Destruction, which requires the greatest commitment of FA assets, puts the target out of action for a prolonged period of time. Depending on the type, morale, and discipline of the enemy force, 30% casualties will usually render a target ineffective or destroyed. For this commitment of artillery assets, the target must be located with greater precision than that which is required for a neutralization mission. It should be noted that the normal target effect achieved by direct support artillery will be suppression. This is due to the lack of TA assets at brigade level to locate targets with the required degree of accuracy, as

well as the difficulty in accurately adjusting artillery fire against a moving force.

Engagement of targets that have been identified, located, and evaluated is conducted with the TACFIRE computer system which provides automated command and control for field artillery units. This system can process information and maintain files for two artillery battalions and all associated subscribers. In the event of one system's failure, the other TACFIRE system can fight the battle for both units. Once a target list is loaded into the computer, TACFIRE performs a preliminary target analysis which compares available fire units and delivery means and their potential effectiveness against the target with the best munitions mix for each fire unit, the optimum target effect the delivery system can achieve, and the recommended volume of fire.

The commander can also specify his intent and influence the priority of fire mission processing through the establishment of computer parameters which define his attack guidance. Programmed by the operator, the commander's criteria define attack methods, percent of target damage desired, priority of selection of fire units, and exclusion of any fire units and/or shell/fuze combination, if appropriate.¹²

The brigade FSE is linked to the TACFIRE system by the Variable Format Message Entry Device (VFMED). This device allows the FSE at brigade to transmit and receive information from the TACFIRE computer and use its inherent processing capabilities. It must be stressed that although the VFMED allows the brigade FSE a digital communications link with the supporting FA battalion and other TACFIRE subscribers, he is denied access to its target development and processing capabilities if that link is disrupted.

The DTOC is not vulnerable to a similar disruption as a TACFIRE system is contained within the DIVARTY TOC and collocated with or in close proximity to the division tactical operations center. Once the advanced field artillery tactical data system (AFATADS) is fielded, however, this problem will be mitigated as AFATADS provides the brigade FSE a target processing capability in his TOC without the need to be linked to TACFIRE.

IV. INDIRECT FIRE: EMPLOYMENT AND EFFECTS

A U.S. brigade defending its assigned sector against a enemy attacking force can expect to encounter one tank or motor rifle regiment in the lead echelon followed by an additional regiment no more than 30 km distant. In the defense, the deep battle focus for the brigade could be to identify targets and destroy follow-on and uncommitted elements of the regiment in contact so as to reduce the enemy's ability to mass at the FLOT and create opportunities for friendly offensive action.¹⁴ This means the brigade commander must divide his attention and assets between the elements of the attacking regiment in contact at the FLOT as well as the regiment's uncommitted second echelon, normally a tank or motor rifle battalion. The attention of the division commander is correspondingly divided between the enemy regiments in contact along the FEBA as well as the uncommitted portions of the THREAT division which could consist of as much as two maneuver regiments plus an independent tank battalion. Corps fire support assets, to include fixed-wing aviation, would assume responsibility for follow-on THREAT divisions. This delineation of responsibilities has been adopted by V (U.S.) Corps in Germany as the manner in which it will counter THREAT echelonment of forces.¹⁵ A totally different approach has been adopted by VII

(U.S.) Corps stationed in the southern portion of Germany. Their intent is to employ consolidated Multiple Launched Rocket Systems (MLRS) and non-nuclear Lance surface to surface missiles against the second echelon regiments of committed enemy divisions while Battlefield Aerial Interdiction (BAI) is directed against follow-on divisions.¹⁶

Within the U.S. military community there is clearly a lack of consensus as to which level of command has responsibility for interdicting or destroying each succeeding THREAT echelon. Given the finite amount of deep attack assets available, the issue of assigning responsibility for destruction of the two echelons of committed THREAT divisions assumes paramount importance. If the U.S. division commander can efficiently destroy all regiments of the THREAT division facing him with organic assets, then the assets available to the corps commander can prevent the follow-on THREAT divisions from arriving at the point in time required by Soviet doctrine for the attainment of mass. As field artillery (FA) units constitute the overwhelming majority of deep battle assets available to the division commander, a review of FA doctrine is the next point for consideration.

Field Manual 6-20, Fire Support in Combined Arms Operations, outlines the key FA tasks in defensive operations:

- Disorganize, delay, and weaken the enemy before his attack begins.
- Strip away enemy reconnaissance and Air Defense Artillery (ADA).
- Strike enemy formations as they attack.
- Deny use of chosen avenues of approach.
- Canalize enemy formations.
- Suppress his direct and indirect fire weapons.

The division commander allocates available FA units to accomplish these tasks by assigning a tactical mission to each artillery

unit. Figure 3-1 depicts the responsibilities of FA tactical missions.

AN FA UNIT WITH A MISSION OF				
	DIRECT SUPPORT	REINFORCING	GENERAL SUPPORT REINFORCING	GENERAL SUPPORT
1. Answers calls for fire in priority from—	1. Supported unit 2. Own observers ¹ 3. Force FA HQ	1. Reinforced FA 2. Own observers ¹ 3. Force FA HQ	1. Force FA 2. Reinforced unit 3. Own observers ¹	1. Force FA HQ 2. Own observers ¹
2. Has as its zone of fire—	Zone of action of supported unit	Zone of fire of reinforced FA	Zone of action of supported unit to include zone of fire of reinforced FA unit	Zone of action of supported unit
3. Furnishes FIST/FSO—	Provides temporary replacements of casualty losses as required	No requirement	No requirement	No requirement
4. Furnishes liaison officer to—	No requirement	Reinforced FA unit HQ	Reinforced FA unit HQ	No requirement
5. Establishes communications with—	FIST chiefs, FSOs, and supported maneuver unit HQ	Reinforced FA unit HQ	Reinforced FA unit HQ	No requirement
6. Is positioned by—	DS FA unit commander or as ordered by force FA HQ	Reinforced FA unit or as ordered by force FA HQ	Force FA HQ or reinforced FA unit if approved by force FA HQ	Force FA HQ
7. Has its fires planned by—	Develops own fire plans	Reinforced FA unit HQ	Force FA HQ	Force FA HQ

¹Also includes all target acquisition means organic or attached to the FA battalion but not deployed with the maneuver unit; for example, attached radar and survey parties.

FIG. 3-1 FIELD ARTILLERY TACTICAL MISSIONS¹⁷

The number of artillery units allocated to the direct support mission is critical because DS battalions will direct their fires in response to requests by the supported units and will not normally be available to assist in the counterfire (those fires

intended to suppress or destroy enemy indirect fire systems) or deep attack missions. When available, a corps FA brigade consisting of 3-5 cannon battalions will be attached to or given the mission to reinforce the fires of the division. Although the mission of this brigade may be assist deep operations by attacking enemy formations, weapons, supplies, and facilities that are capable of influencing close operations within the next 72 hours, its numbers will be insufficient to redress the imbalance in tube artillery and heavy mortars that the friendly division commander will have to face.

Each Soviet division can employ its organic assets of 18 152mm howitzers, 108 122mm howitzers, 18 122mm Multiple Rocket Launchers (MRL), and 54 120mm mortars.¹⁸ In the attack, these already considerable assets will be augmented by up to nine additional FA battalions provided by Front, Army, and uncommitted divisional assets.¹⁹ If the U.S. division commander has allocated all of his 155mm FA battalions to the close-in battle by giving them a direct support mission, he is faced with the significant task of fighting the deep and counterfire battles with one MLRS battery of nine launchers, two attack helicopter battalions, and the corps FA brigade of 3-5 battalions. Opposing him will be up to **seventeen** battalions of tube artillery plus heavy mortars. The apportionment of friendly artillery and mortars between the close-in battle and deep battles will be of crucial importance.

Against the substantial numbers and varied types of THREAT indirect fire assets, the division commander must rely upon the M109 series 155mm and M110 series 203mm howitzers, and the MLRS battery. Performance data for these howitzers is depicted in Table 3-2.

Weapon	Basic Load (Rds)	Range (meters)	Max Rate of Fire No. Rds First 3 min	Sustained Fire Rds per Hr
M109 A2/A3 155mm	234	18,100 24,000 (RAP)	12	60
M110 A2 203mm	138	23,000 29,000 (RAP)	4.5	30

TABLE 3-2 U.S. HOWITZER PERFORMANCE CHARACTERISTICS²⁰

Battalions employing the M110 series howitzer are found only in corps artillery units. Lacking assigned FIST personnel, these units would not normally be assigned to provide direct support for a maneuver unit. The M109 series howitzer, however, is the weapon that fulfills the direct support mission in all heavy divisions. The MLRS battery, mentioned previously, is never subordinated lower than division level.

The other weapon system in the division capable of providing indirect fires in support of maneuver units is the M30 107mm series mortar. Each mechanized infantry and armor battalion in the division contains a heavy mortar platoon consisting of one officer, 34 men, six 107mm mortars mounted in a tracked carrier, and two Fire Direction Centers (FDCs) mounted in armored command post vehicles. Each ground cavalry troop in the divisional cavalry has two additional mortars, giving the heavy division a total of 64 heavy mortars. Characteristics for this indirect fire system are provided in Table 3-3.

Ammunition	Min Range (meters)	Max Range (meters)	Rate of Fire
HE M329A2	770	6840	18 Rds for 1 min followed
HE M329A1	920	5650	by 9 Rds/min for 5 min, then
WP M328A1	920	5650	3 Rds sustained

TABLE 3-3 U.S. HEAVY MORTAR CHARACTERISTICS²¹

Equally important to the characteristics of these indirect fire systems is an understanding of their effectiveness in producing casualties on the battlefield. Weapon lethality is a function of target size and protection, as well the type of munition employed. If we assume the baseline projectile for consideration is an Improved Conventional Munition (ICM) capable of penetrating 2.4 inches of armor as well as possessing fragmentation effect against exposed personnel, then the key discriminators become the size of the target and the number of rounds applied against the target area. When computing how projectiles should strike a target area to maximize target effect, ballistics dictates that a rectangular sheaf is employed when a target's length is less than or equal to five times its width. When the opposite is true, and the target's width is the dominant dimension, then a linear sheaf and the appropriate data is applied to the guns. When the enemy presents a concentrated target, a converged sheaf using the enemy center of mass as the aiming point is the correct approach.

Damage inflicted upon the enemy unit will differ significantly with the type of sheaf employed by the firing unit. The following two tables illustrate this point. Each table assumes a four gun 155 mm M109A2/A3 howitzer platoon has engaged

the size and type target specified at the ranges indicated with a total of 36 rounds (9 rds per tube) of M483A1 ICM projectiles. The number indicated is the percentage of targets that becomes firepower or mobility casualties. Ranges from the target to the guns are expressed in kilometers and target size is given in meters.

TABLE 3-4: T-72 TANKS IN OPEN TERRAIN.²²

Target Size	Range 4 km	Range 12 km	Range 16km
10x500	.03	.03	.03
500x10	.04	.04	.04
100x100	.09	.09	.07
250x250	.04	.03	.03
500x500	.02	.02	.02

TABLE 3-5: BMPS IN OPEN TERRAIN.²³

Target Size	Range 4 km	Range 12 km	Range 16km
10x500	.19	.18	.15
500x10	.26	.27	.26
100x100	.53	.51	.45
250x250	.23	.23	.21
500x500	.07	.07	.08

It should be apparent from the above tables that the maximum target effect is achieved when the firing unit (in this case a four gun platoon) utilizes a converged sheaf (100x100 meters target area) against a concentrated enemy formation.

Surprisingly, there is only a minimal degradation in target effect at extended ranges. At all ranges, however, a converged sheaf proves to be nearly twice as effective as a rectangular (10x500 meters) sheaf or a linear (500x10) sheaf. Statistics for the M30 series 107mm mortar display the same variations of target effect consistent with the type of firing sheaf employed.²⁴

For a heavy division commander who is tremendously outnumbered in tube artillery by an attacking, reinforced THREAT division, the temptation to reassign 155mm artillery battalions away from the direct support of maneuver units and to the deep and counterfire battles is strong. Doctrine which requires maneuver units to be provided direct support artillery and the real need for indirect fire along the FEBA are the reasons that hold such temptations in abeyance. Previous sections of this paper explored which level of command, division or brigade, had the better capability to acquire enemy intelligence, develop targets from that intelligence, and transmit those targets to indirect fire assets. Although the division clearly possesses the better capabilities, the bulk of its indirect fire assets are allocated to the maneuver brigades. Also discussed were potential vulnerabilities presented by THREAT doctrine that could be exploited by the optimum employment of friendly fire support assets. The final portions of this paper will examine the competing requirements of the close-in and deep upon indirect fire assets, and assess how direct support artillery and organic heavy mortars can best be utilized to fulfill both missions.

V. DIRECT SUPPORT ARTILLERY AND MORTARS: WHO SHOULD DO WHAT?

In answering this question, it is best to review first what we expect fire support to do on the battlefield. As discussed

previously, the key indirect fire tasks in defensive operations are to disrupt and weaken the enemy before he attacks, neutralize key THREAT combat support assets thereby denying him the ability to synchronize his actions, canalize his formations, frustrate his initiative, suppress his weapons systems, and destroy as much of his force as possible. The ability of mortars and artillery to accomplish these tasks is dependent upon which targets they engage, who controls their fires, how they are employed by the owning headquarters, and the lethality and capabilities of the munitions and systems available.

THREAT doctrine, as explored earlier, presents critical targets for interdiction. Early destruction of his reconnaissance units prevents enemy observation of the main battle area. Neutralization of THREAT ADA radars enhances the effectiveness of friendly aviation and attack helicopters by degrading his ADA systems. Destruction of engineer MSDs reduces his mine clearing capability and increases vulnerability to friendly use of Field Artillery Scatterable Mines (FASCAM). THREAT communications jamming and radio direction finding (DF) equipment, most of which is mounted in low mobility wheeled vehicles, also presents a lucrative target. Early destruction of these types of targets is recognized by U.S. doctrine to enhance the close-in fight more than the simple attrition of tanks and BMPs.²⁵ THREAT overreliance on advance planning and his orders-oriented command style are extremely dependent upon combined arms coordination and consequently, greatly vulnerable to disruption by indirect fires.

If friendly artillery and mortars are placed one-third of their effective range behind the FLOT, then heavy mortars will be able to range THREAT units in contact and regimental artillery

groups. Artillery units, using high explosive (HE) rocket assisted projectiles (RAP) when necessary, will be able to range all targets presented by the committed THREAT regiment, including its critical logistics facilities. Although the direct support artillery will be able to range all of these targets, it will not engage them because the target acquisition means supporting the maneuver brigade and the concerns of the brigade commander for the close-in battle will restrict the fires of the 155mm howitzer units to within 3-5 kilometers of the FLOT. If, however, those same howitzer units were firing under division control and capitalizing upon the superior TA and target development assets at division level, they would be better able to engage key THREAT vulnerabilities early in the battle and prevent the enemy from massing at the FLOT on his own terms. Catching the enemy in march columns that have been acquired at NAIs and fixed at TAIs will inflict greater damage upon the enemy and lessen the pressure on defending forces at the FEBA than if the indirect fires are not employed until the attacking force is within 1-5 km of the FLOT and deployed into platoon columns or assault formation.

Once an enemy formation has deployed out of column formation, it presents the fire support element with multiple aiming points to engage, and decreases the likelihood that a converged sheaf can be employed, which is the most effective firing technique. If the target momentum has not been slowed or halted by battlefield clutter, aerial interdiction, or friendly obstacles, then the possibility of a friendly observer being able to adjust artillery fire on a moving force is remote.²⁶ In this event, the most realistic target effect that can be obtained by either artillery or mortars is suppression, a temporary effect that will exist only

so long as the indirect fires are continued.

In essence, artillery employed solely within 1 to 5 km of the FLOT duplicates the capability of heavy mortars which potentially could perform the mission. Our current heavy mortar is limited to a 6900 meter range and does not possess a munition capable of penetrating light armor such as DPICM. Numerous Western and NATO allies, however, have already fielded self propelled 120mm mortars with DPICM projectiles that can range out to 10 kilometers.²⁷ Greece has developed an improved conventional munition for the M30 107mm mortar which can penetrate the same armor thickness as the DPICM fired by artillery units.²⁸ By upgrading ammunition or adopting a larger caliber weapon, our heavy mortars could have a destructive potential comparable to the 155mm howitzer. The U.S. Army has recognized this fact, and has announced plans to begin fielding a 120mm mortar commencing fiscal year 1992.²⁹ By fielding a more capable mortar, and increasing the number of tubes in each mortar platoon from six to eight, a three battalion maneuver brigade could possess an indirect fire potential comparable to a 24 gun DS artillery battalion and capable of engaging any target the brigade can see with its assets. If a minelaying round for the mortar could also be fielded, then the brigade could emplace its own hasty obstacles and allow the division to use its FASCAM assets in the deep battle.

Field artillery scatterable mines are used by the brigade in the defense to close gaps, lanes, and breaches in obstacles, delay or disrupt attacking forces, deny the enemy of terrain, and disrupt the movement of uncommitted echelons. Table 4-1 depicts the three types of FASCAM minefields and their associated densities and logistics costs.

Type of Minefield	#RAAMS per Aiming Point/ desired density*	#ADAM per Aiming Point/ desired density*
Low Density (harrassment)	24/0.001	3/0.0005
Medium Density (coverage by heavy direct fire)	48/0.002	6/0.001
High Density (coverage by light direct fire)	96/0.004	12/0.002

*mines per square meter

TABLE 4-1 FASCAM MINEFIELDS²⁰

The table shows that a low density minefield designed to harrass the enemy without direct fire coverage requires 24 Remote Anti-armor Mine System (RAAM) projectiles and three Area Denial Artillery Munition (ADAM) projectiles to produce the indicated minefield density. Delivery times for a standard sized (400x400 meters) FASCAM minefield are shown in Table 4-2. These times include planning, coordination, data computation, and firing times.

Type of Minefield	Preplanned Minefield	Target of Opportunity Minefield
Low	5-7 min	25-30 min
Medium	7-12 min	30-35 min
High	12-20 min	35-40 min

TABLE 4-2 FASCAM DEPLOYMENT TIMES²²

The considerable emplacement times for FASCAM minefields suggest they will not be delivered in time to make a difference during the fast-paced battle at the FLOT when the brigade decision making process will be stretched to the limit by the speed of the enemy's

attack and the complexities of the direct fire battle. If the brigade commander must choose between the firing of FASCAM or DPICM, the minefield will probably not be employed. A better use for these assets would be under division control. FASCAM fired into target areas of interest would disrupt the THREAT's momentum well before enemy forces approached the FLOT and cause him to present a more concentrated and lucrative target for destruction by indirect fires and attack helicopters.

Employment of attack helicopters as part of Joint Air Attack Teams (JAAT) would be enhanced by the reallocation of DS artillery to division control. A successful JAAT mission is dependent upon suppression of enemy air defense, or SEAD. For SEAD to be effective, known or suspected locations of enemy ADA weapons or radars and command and control installations critical to the integration of ADA systems must be targeted. The planning staffs and intelligence acquisition means to provide the targeting function are available; what is lacking are adequate indirect fire systems to provide the suppression of ADA systems. Retaining additional artillery under divisional control would rectify that problem and enhance the overall combat effectiveness of JAAT missions.

VI. CONCLUSIONS

Shifting the bulk of the division's artillery assets to the deep battle will pay great dividends as the division commander attempts to prevent the enemy from achieving mass and momentum at the decisive point and time. Lacking DS artillery, an upgraded heavy mortar capability will provide the maneuver commander with a tremendous indirect fire potential for the close-in battle.

Soviet doctrine and U.S. flexibility provide us the opportunity, however, literally to "have it both ways", that is to say, artillery units that can wage both the deep and close-in battles and be available for the maneuver brigade commander at the critical point in the battle.

Soviet offensive doctrine creates " windows of opportunity" for the defender. At the division level, first and second echelon regiments are separated by 15-30 kilometers. During the time THREAT regiments are being attrited by friendly artillery units firing in support of the division commander's deep battle, it is entirely conceivable that the attrited regiments will have closed to the main battle area and no other deep battle targets will have appeared within range of the artillery's fires because of the way the enemy echelons his forces. The question then becomes one of efficiently transitioning the fires of the artillery from the deep to the close-in battle. The solution to this problem requires three distinct and relatively uncomplicated actions.

First, artillery units that were assigned previously the direct support mission should be given the mission of General Support Reinforcing (GSR) and be allocated on the basis of one GSR battalion per committed maneuver brigade. Although FA units reinforce other artillery units by doctrine, a nonstandard mission would be assigned in which the GSR units reinforce the mortar fires of the maneuver brigade they are supporting. This will cause the GSR battalions to position their batteries in the supported brigade's sector. As long as deep targets present themselves, the 155mm howitzer battalions will answer calls for fire in accordance with table 3-1. In this case they will respond to the DIVARTY TOC which is the Force FA headquarters for the

division. When engagement of deep targets within range of the GSR battalion is complete, it can then respond to calls for fire from the supported brigade. The forward observers of the GSR battalion will not be needed when deep battle targets are being engaged and should remain with the supported maneuver brigade to facilitate the transition of fires back to the close-in battle.

The second task that must occur is to integrate upgraded battalion heavy mortar platoons fully into the FA fire direction system. Equipping mortar platoons with a Battery Computer System (BCS) programmed for mortar operations and a Positioning and Azimuth Determining System (PADS) or equivalent will ensure mortar fires are extremely accurate, more responsive, and fully able to interface with TACFIRE. This will enable the maneuver brigade FSE and maneuver battalion FSOs to maintain visibility with all mortar platoons in the brigade, as well as efficiently reinforce their indirect fires with those of the GSR artillery battalion, when available.

Finally, fire support coordination measures must be drawn in such a way so as to provide maximum latitude for the engagement of deep targets. The Coordinated Fire Line (CFL) is the line beyond which conventional fire support means such as artillery and mortars may fire at any time within the zone of the establishing headquarters without additional coordination. Normally established by a brigade, the CFL may serve to inhibit engagement of THREAT regiments if it is drawn too far from the FLOT. Remembering that a THREAT regiment will begin its transition from regimental column to more dispersed formations between 8-12 km from the expected line of contact, a CFL should be established no further than 6km from the FLOT. This will allow the brigade to

engage all targets it can see and still permit divisional artillery assets to engage attacking regiments while they are most vulnerable to artillery interdiction and destruction.

As precision guided munitions (PGM) such as SKEET and SADARM come into the inventory, the possibility of decimating an enemy force before he is allowed to mass against the defender will increase. Such a prospect clearly has the Soviets worried, and they are concerned they will not be able to protect their forces from PGMs.²² Nor is it likely that they will be able to lessen their dependence on column movements and battle drill in the attack which make the reallocation of direct support assets to the deep battle so inviting.²³

The demands placed upon finite resources by the equally important close-in and deep battles could ideally be resolved by forming new artillery units for use by the division commander in the deep battle, or creating additional MI assets and placing them at the disposal of the maneuver brigade commander. Personnel and resource constraints, however, will make the formation of additional units highly unlikely unless sufficient offsets in other units can be identified. It is interesting to note that all heavy mortar platoons in the United States Army Europe (USAREUR) could be upgraded from six to eight mortars per platoon for a personnel cost that is less than the personnel strength of one corps artillery 155mm howitzer battalion.²⁴ In order to compensate for increased mortar ammunition expenditure, one additional 8 ton truck (HEMMT) assigned to each maneuver battalion support platoon would be adequate to transport the additional requirement.

Direct support artillery in the defense has traditionally been an indirect fire asset upon which the maneuver brigade

commander has relied. This reliance may have contributed to a situation in which unit heavy mortars that are equally capable of providing the suppressive fires critical to the close-in fight are underemployed, and in many cases, neglected.

Both artillery and mortars have unique capabilities and limitations. Artillery, with its greater range and destructive potential, is capable with proper employment of destroying or severely damaging the enemy before he arrives at the FLOT. Mortars, with their greater responsiveness and sustained rate of fire, are ideally suited to provide suppressive fires throughout the depth of the brigade's close-in fight. As currently utilized, we neither maximize employment of the systems available or optimize their destructive potential.

A revision in the manner in which we regard direct support artillery can potentially provide U.S. Army heavy divisions with a tremendous increase in combat capability. The inherent flexibility and capabilities of divisional artillery units can only be exploited if maneuver commanders discard their traditional doctrinal biases and optimize the employment of the systems they possess.

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23. Ibid., p. 3-168. See previous note concerning modification of classified data contained within this source.

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A190842

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED			1b. RESTRICTIVE MARKINGS		
2a. SECURITY CLASSIFICATION AUTHORITY			3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution unlimited		
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE					
4. PERFORMING ORGANIZATION REPORT NUMBER(S)			5. MONITORING ORGANIZATION REPORT NUMBER(S)		
6a. NAME OF PERFORMING ORGANIZATION School of Advanced Military Studies, USAC&GSC		6b. OFFICE SYMBOL (If applicable) ATZL-SWV	7a. NAME OF MONITORING ORGANIZATION		
6c. ADDRESS (City, State, and ZIP Code) Fort Leavenworth, Kansas 66027-6900			7b. ADDRESS (City, State, and ZIP Code)		
8a. NAME OF FUNDING/SPONSORING ORGANIZATION		8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER		
8c. ADDRESS (City, State, and ZIP Code)			10. SOURCE OF FUNDING NUMBERS		
			PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.
			WORK UNIT ACCESSION NO.		
11. TITLE (Include Security Classification) Direct Support Artillery for the Defensive Battle: Is It an Outmoded Concept?(U)					
12. PERSONAL AUTHOR(S) MAJ Henry S. Scharpenberg, USA					
13a. TYPE OF REPORT Monograph		13b. TIME COVERED FROM _____ TO _____		14. DATE OF REPORT (Year, Month, Day) 87/12/04	
15. PAGE COUNT 42					
16. SUPPLEMENTARY NOTATION					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP			
			direct support artillery		
			defensive operations		
			heavy mortar platoons		
			Brigade close-in battle		
			Countering Soviet momentum		
			US Target & Intel Capabilities		
19. ABSTRACT (Continue on reverse if necessary and identify by block number)					
<p>This monograph examines the feasibility of retaining traditionally direct support artillery under division control to capitalize upon the division's superior targeting and intelligence capabilities in order to defeat an enemy who echelons his forces to achieve mass and momentum. Soviet doctrine is examined to determine if specific opportunities for disruption of offensive momentum exist and if those opportunities can be exploited by the intelligence acquisition and target development capabilities at division level.</p> <p>The study concludes that the level of command in the division with the greatest allocation of field artillery assets is not able to locate and engage targets early enough to prevent their mass and momentum from being felt at the FLOT. It recommends the upgrading of maneuver battalion heavy mortar platoons to collectively provide the brigade commander with indirect fire capability critical to the close-in battle. Previously committed DS artillery will then be available for the Deep Battle at division level.</p>					
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT <input type="checkbox"/> DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED		
22a. NAME OF RESPONSIBLE INDIVIDUAL MAJ Henry S. Scharpenberg			22b. TELEPHONE (Include Area Code) (913) 684-2138		22c. OFFICE SYMBOL ATZL-SWV

END

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